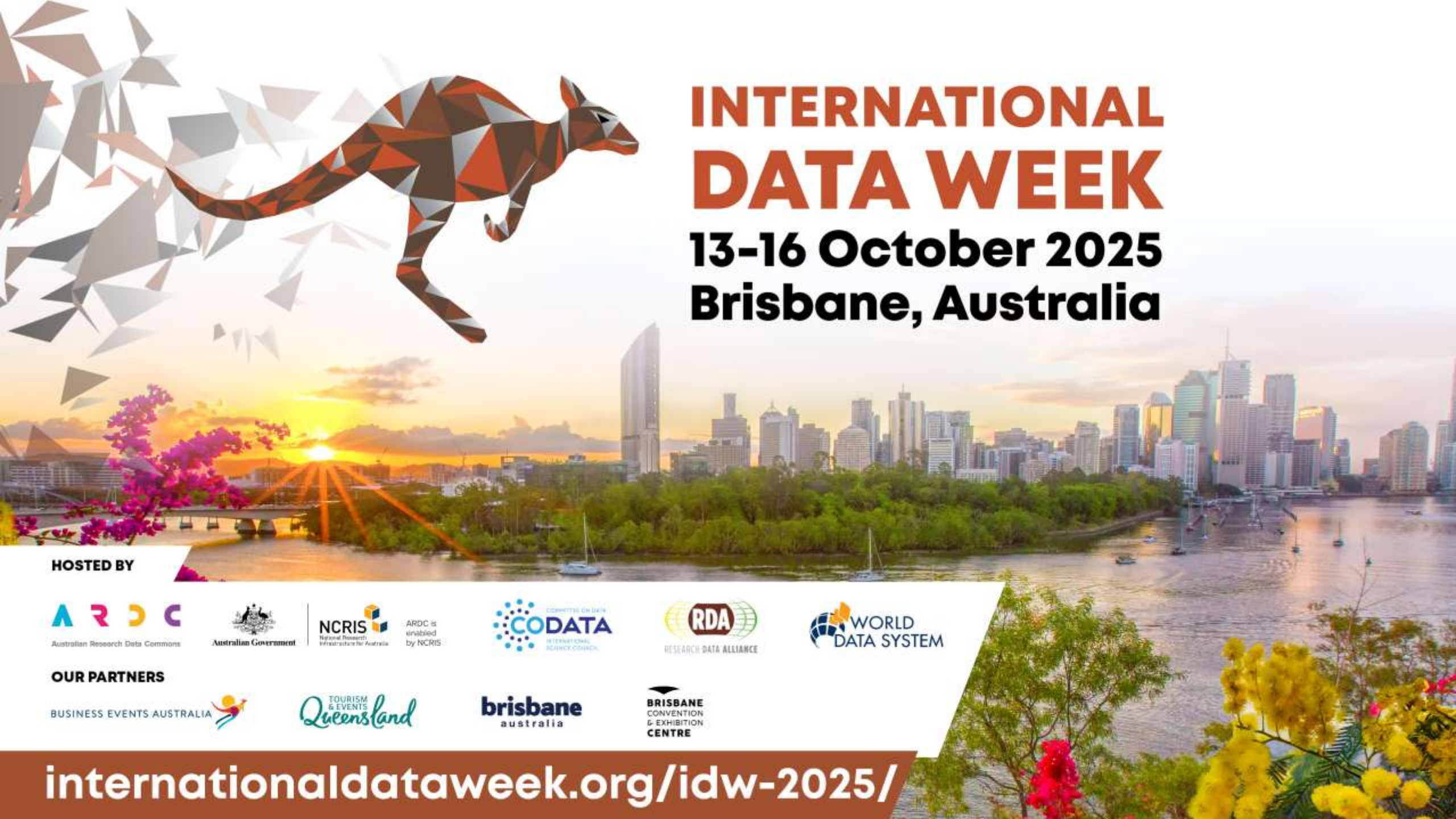
INTERNATIONAL
DATA WEEK
13-16 October 2025
Brisbane, Australia
HOSTED BY
Australian Research Data Commons
Australian Government
NCRIS
National Research Infrastructure for Australia
ARDC is enabled by NCRIS
CODATA
RDA
RESEARCH DATA ALLIANCE
WORLD DATA SYSTEM
OUR PARTNERS
BUSINESS EVENTS AUSTRALIA
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brisbane australia
BRISBANE CONVENTION & EXHIBITION CENTRE
internationaldataweek.org/idw-2025/

PIDs infrastructure for open data sharing

LIU JIA

Computer Network Information Center

Chinese Academy of Sciences

INTERNATIONAL DATA WEEK
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Background

The UNESCO Recommendation on Open Science

The UNESCO Recommendation on Open Science (https://www.unesco.org/en/legal-affairs/recommendation-open-science) was adopted by the General Conference of UNESCO(United Nations Educational, Scientific and Cultural Organization) at its 41st session, on 23 November 2021. The persistent identifier is taken as the essential part of the "Open science infrastructures" as well as the one of the "Investing in open science infrastructures and services". CSTR is the global identifier for common science and technology resources, it is the committed practitioner of the global open science, fostering the PID infrastructure for open science.

9. **Open science infrastructures** refer to shared research infrastructures (virtual or physical, including major scientific equipment or sets of instruments, knowledge-based resources such as collections, journals and open access publication platforms, repositories, archives and scientific data, current research information systems, open bibliometrics and scientometrics systems for assessing and analysing scientific domains, open computational and data manipulation service infrastructures that enable collaborative and multidisciplinary data analysis and digital infrastructures) that are needed to support open science and serve the needs of different communities. Open labs, open science platforms and repositories for publications, research data and source codes, software forges and virtual research environments, and digital research services, in particular those that allow to identify unambiguously scientific objects by persistent unique identifiers, are among the critical components of open science infrastructures, which provide essential open and standardized services to manage and provide access, portability, analysis and federation of data, scientific literature, thematic science priorities or community engagement. Different repositories are adapted to the specificity of the objects they contain (publications, data or code), to local circumstances, user needs and the requirements of research communities, yet should adopt interoperable standards and best practices to ensure the content in repositories is appropriately vetted, discoverable and reusable by humans and machines. Open innovation testbeds including incubators, accessible research facilities, open license stewards, as well as science shops, science museums, science parks and exploratories, are additional examples of open science infrastructures providing common access to physical facilities, capabilities and services. Open science infrastructures are often the result of community-building efforts, which are crucial for their long-term sustainability and therefore should be not-for-profit and guarantee permanent and unrestricted access to all public to the largest extent possible.

(e) Federated information technology infrastructure for open science, including high-performance computing, cloud computing and data storage where needed, and robust, open and community managed infrastructures, protocols and standards to support bibliodiversity and engagement with society. While avoiding fragmentation by enhancing the federation of existing open science infrastructures and services, at the national, regional and international levels, attention should be given to ensuring that this infrastructure is accessible for all, internationally interconnected and as interoperable as possible, and that it follows certain core specifications, notably the FAIR (Findable, Accessible, Interoperable, and Reusable) and CARE (Collective Benefit, Authority to Control, Responsibility and Ethics) principles for data stewardship. Technical requirements specific to every digital object of significance for science, whether a datum, a dataset, metadata, code or publication, should also be addressed. The capacities of data stewardship infrastructures should serve the needs of all scientific disciplines in an equitable way, regardless of the volume and nature of data they use and the methods they employ to process it. Open science infrastructures and services should be oriented towards the needs of scientists and other audiences using them, develop functionalities tailored to their practices and present user-friendly interfaces. Due care should also be given to persistent identifiers of digital objects. Examples include the definition and attribution of open persistent identifiers as appropriate for each type of digital object, the necessary metadata for their efficient assessment, access, use and re-use, and proper stewardship of data by a trusted regional or global networks of data repositories.

Background

A variety of PIDs are being used in open data sharing

PMID: 28339860

arXiv:2111.06845

Bibcode: 1974AJ.....79..819H

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What is CSTR

CSTR

Common Science and Technology Resource

- Based on the National Standard

  GB/T 32843—2016

  "Science and technology resource identification "

China National Standards

CSTR Numbering Specification

CSTR: XXXXX . XX . XXX... XXX

Internal identifier (variable length)

Science and Technology resource type code (2-digit code)

Science and Technology Resource Identification Registration Institution Code (5 digits)

◆Example:

CSTR:31253.11.sciencedb.170.25

- ***"31253"*** *is the Registration Institution Code*
- ***"11"*** *is the Scientific data code*
- ***"sciencedb.170.25"*** *is the internal code.*

Resource Type

CODE	NAME	EXPLAIN
02	**Major Science and Technology Infrastructure**	Major science and technology infrastructures include large and complex scientific research systems that provide the means to explore the unknown, discover the laws of nature and achieve technological change at the limits of research
04	**Plant germplasm resources**	Plant genetic diversity resources are the genetic carrier materials formed by all plant genes in a specific ecological space and time.
11	**Scientific data**	The collection of primitive and basic data accumulated in scientific and technological activities of human society or acquired in other ways to reflect the nature, characteristics, and changing laws of the objective world, as well as all kinds of data systematically processed and sorted according to the needs of different scientific and technological activities.
14	**Papers**	Types of Papers include journal papers, conference papers, dissertations, etc.
16	**Patents**	Types of patents include invention, utility model and design patents
17	**Standards**	Types of standards include international standards, national standards, industry standards, local standards, corporate standards, group standards, etc.

Our Beliefs

Free to have

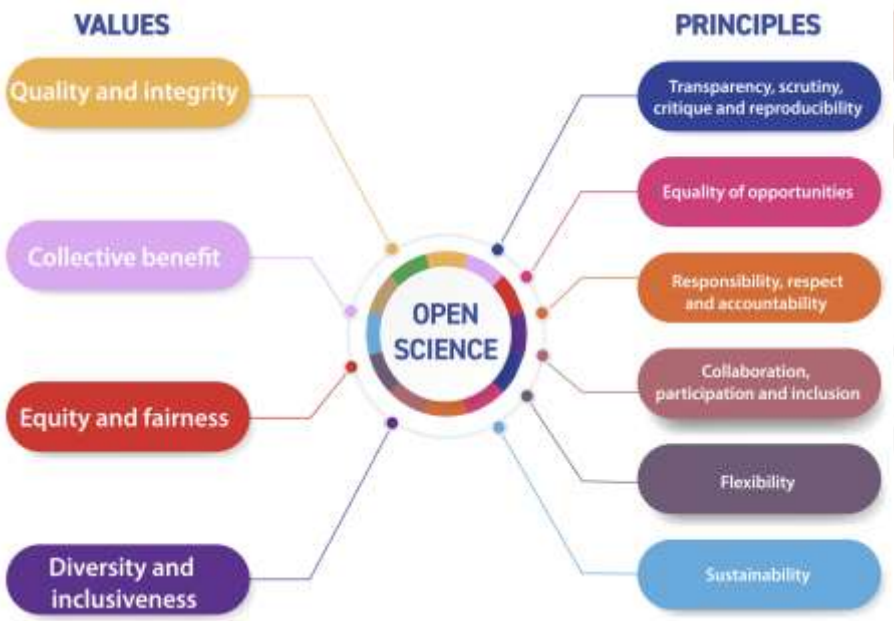
Each institution in the research ecosystem should have the right to use the global identifier for their research output without restrictions on charge which will not ignore any new emerging scientific innovation items resources. CSTR members can keep their own exclusive prefix simply by filling out the application form for free.

Easy to use

It will take a long time to build a globally interworking and well-known identifier and to use the maturity identifier without restrictions. CSTR supports basic services both human and machine-readable to keep the identifier persistent for members without many commitments.

Digital and Physical

The new challenge with the data-driven scientific research paradigm is not the lack of identifiers for digital research outputs but how to support the connective between the digital and physical world. CSTR provides a service that automatically traces the research impact downstream from physical to digital.



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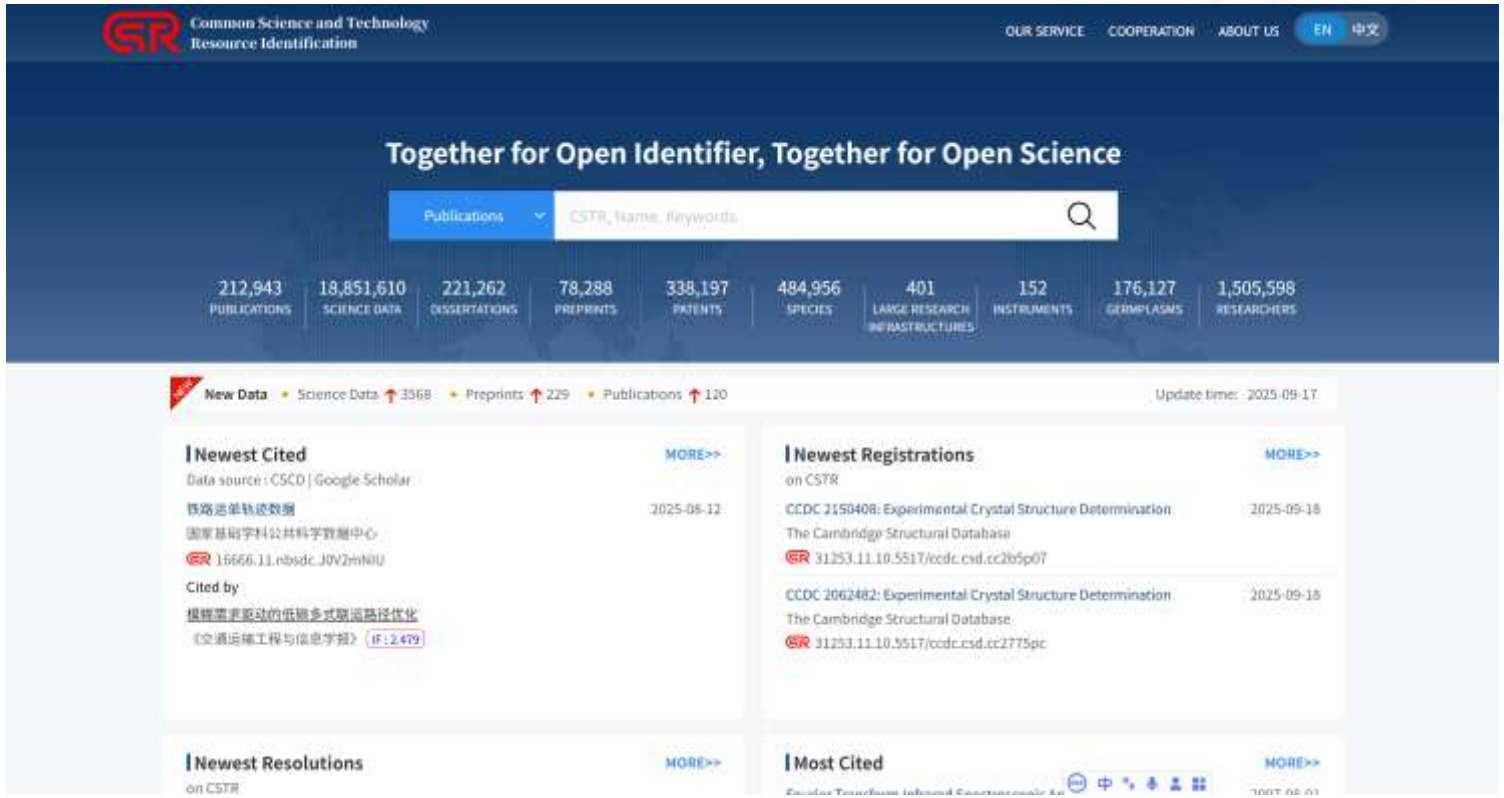
CSTR Identification Platform

CSTR Identification Platform (https://www.cstr.cn/en) is initialed in 2018 based on the National Standard GB/T 32843—2016 "Science and technology resource identification", providing unique identification service for global scientific data, papers, scientific institutions, researchers, scientific instruments, patents and other scientific and technological resources. CSTR is also accepted as the international standard, such as IANA., etc.



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Service/Basic

Basic Service (No Charge)

1. Registration Service

Through the registration of science and technology resource identifiers and metadata, the published science and technology resource are made more discoverable and accessible.

2. Resolution Service

Convenient inquiry and search services are provided by using science and technology resource identifiers, keywords and metadata as inputs.

3. Associated Service

Linking papers to authors, papers to resources, and research processes and results data in a vast network of associations through science and technology resource identifiers.

4. Data Service

Provide multi-dimensional statistical analysis of the total amount of resources, resolutions, and views, forming a comprehensive data service of China's science and technology resource.

Enriched online CSTR statistics and presentation

CSTR registration, resolution API

Service/Citation

Cited by Cell / Nature / Science

3

nature climate change

Article | Published: 22 June 2023

Universal temperature sensitivity of denitrification nitrogen losses in forest soils

75. Ran, Y. *Plant Functional Types Map in China* (NCDC, 2019); https://cstr.cn/11738.11.ncdc.Westdc.2020.632

scientific data

nature > scientific data > data descriptors > article

Data Descriptor | Open Access | Published: 16 August 2022

A bankfull geometry dataset for major exorheic rivers on the Qinghai-Tibet Plateau

31. Ren, H. & Pan, X. Integration dataset of Tibet Plateau boundary. *National Tibetan Plateau Data Center* CSTR: 18406.11.Geogra.tpdc.270099, https://doi.org/10.11888/Geogra.tpdc.270099 (2019).

nature communications

nature > nature communications > articles > article

Article | Open Access | Published: 01 March 2023

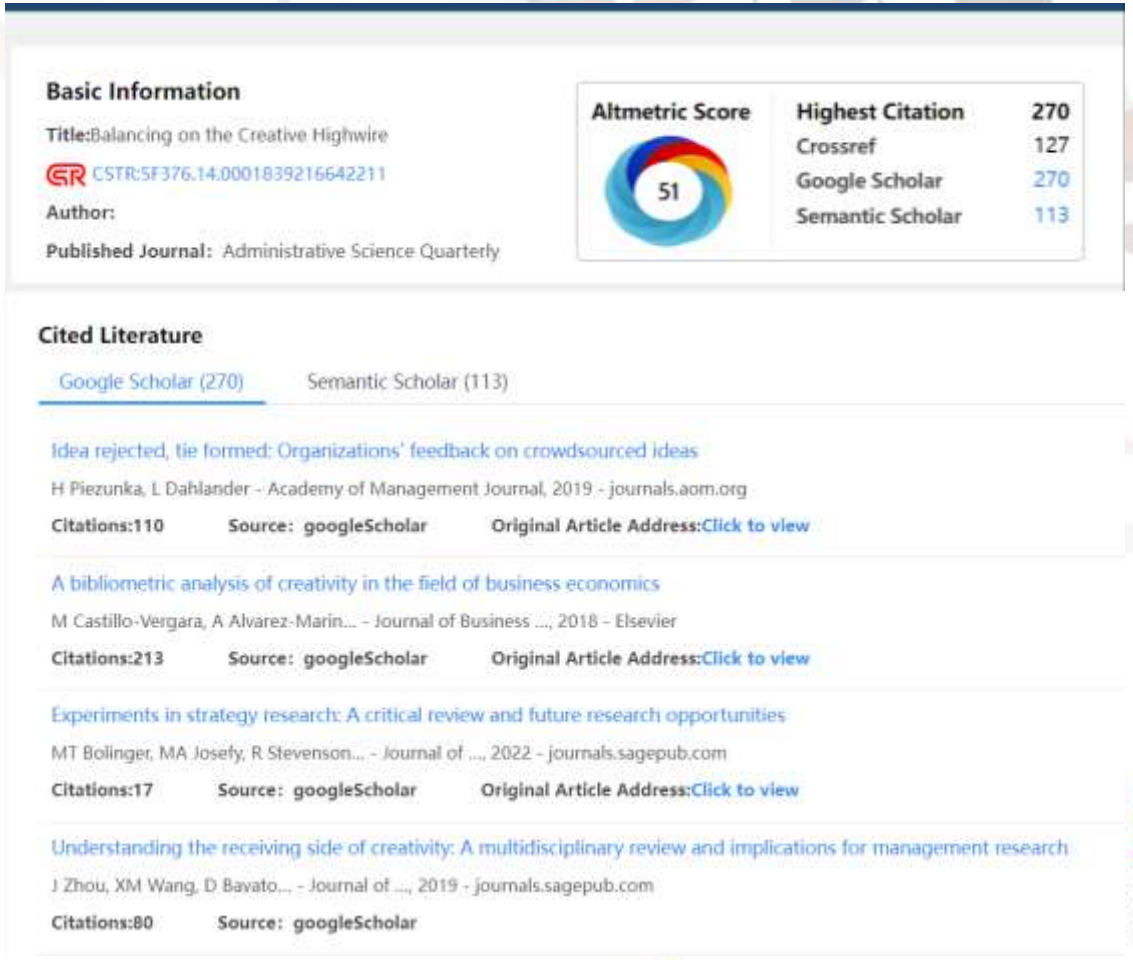
Non-monotonic changes in Asian Water Towers' streamflow at increasing warming levels

65. Zhang, Y., Ren, H. & Pan, X. Integration dataset of Tibet Plateau boundary. https://cstr.cn/18406.11.Geogra.tpdc.270099 (2019)

Service/Reports

Regular User Citation Reports

Multi-Channel Citation List



CSTR Statement

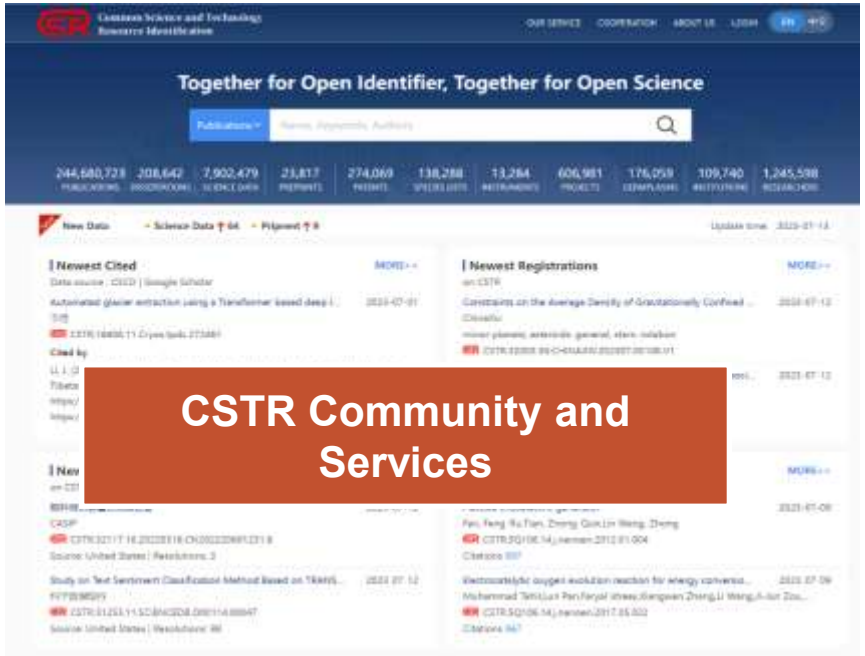
Global connectivity of CSTR

With other PID services, we support due care given to persistent identifiers of digital objects proposed by Open Science Recommendation.

11 type
(academic paper , patent, Scientific data…)

International Cooperation
(IANA,FAO,ORCID Harvard…)

Citation by Journals
(Nature, IEEE, Earth System…)



National Data Center & CAS data Center

PID service provider for

National Data Center and CAS data Center

National Data Center (20)

—Published by Ministry of Science and Technology

序号	国家平台名称
1	国家高能物理科学数据中心
2	国家基因组科学数据中心
3	国家微生物科学数据中心
4	国家空间科学数据中心
5	国家天文科学数据中心
6	国家对地观测科学数据中心
7	国家极地科学数据中心
8	国家青藏高原科学数据中心
9	国家生态科学数据中心
10	国家材料腐蚀与防护科学数据中心

序号	国家平台名称
11	国家冰川冻土沙漠科学数据中心
12	国家计量科学数据中心
13	国家地球系统科学数据中心
14	国家人口健康科学数据中心
15	国家基础学科公共科学数据中心
16	国家农业科学数据中心
17	国家林业和草原科学数据中心
18	国家气象科学数据中心
19	国家地震科学数据中心
20	国家海洋科学数据中心

CAS Data Center (32)

—Published by CAS

国家基础学科公共科学数据中心
国家气象科学数据中心
中国气象数据网 / 权威·开放·共赢
国家地震科学数据中心
NATIONAL EARTHQUAKE DATA CENTER
国家生态科学数据中心
National Ecosystem Science Data Center
植物科学数据中心
中国科学院南京地理与湖泊研究所
国家农业科学数据中心
National Agriculture Science Data Center
中国科学院生态学科数据中心
Chinese Academy of Science Discipline Data Center for Ecosystem
CNITECH
国家家养动物种质资源库
国家极地科学数据中心
National Arctic and Antarctic Data Center
中国科学院心理研究所
INSTITUTE OF PSYCHOLOGY, CAS
National Wild Plant Germplasm Resource Center
国家重要野生植物种质资源库
中国科学院北京基因组研究所（国家生物信息中心）
BEIJING INSTITUTE OF GENOMICS CHINESE ACADEMY OF SCIENCES / CHINA NATIONAL CENTER FOR BIOINFORMATION

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National Data Center & CAS data Center

PID service provider for

National Data Center and CAS data Center

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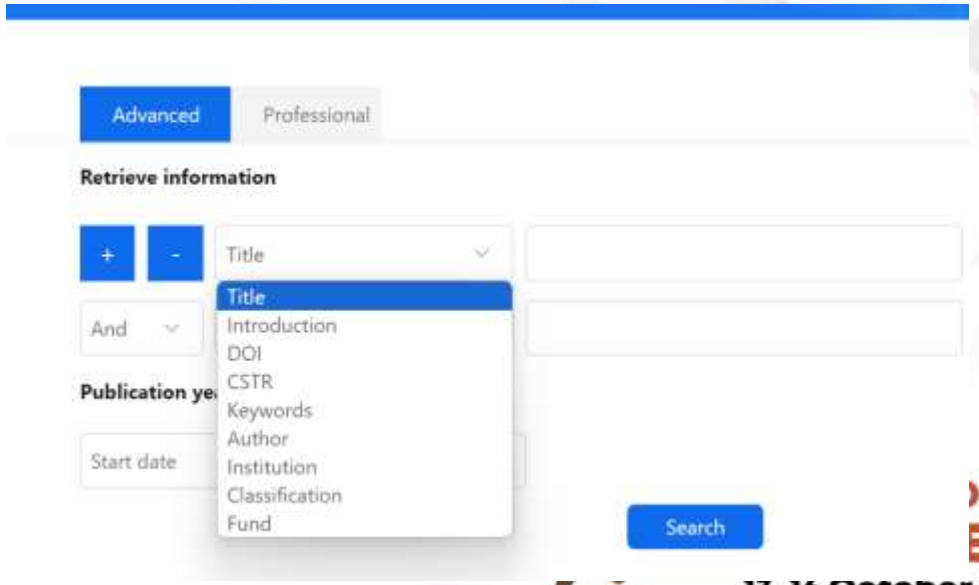
National Advanced Platform

National Advanced Platform for S&T Information and Communication

Supporting various CSTR services for scientific data in National Advanced Platform for S&T Information and Communication.



https://napstic.cn/

Journal Articles

Journal Articles

CSTR supports journals such as China Scientific Data and Frontiers of Data and Computing Development, and cooperates with publishers such as Artech Publishing Group and Chinese Medical Association.

数据与计算发展前沿
Frontiers of Data & Computing

中国科学数据
CSData

有科出版
YOUKE PUBLISHING

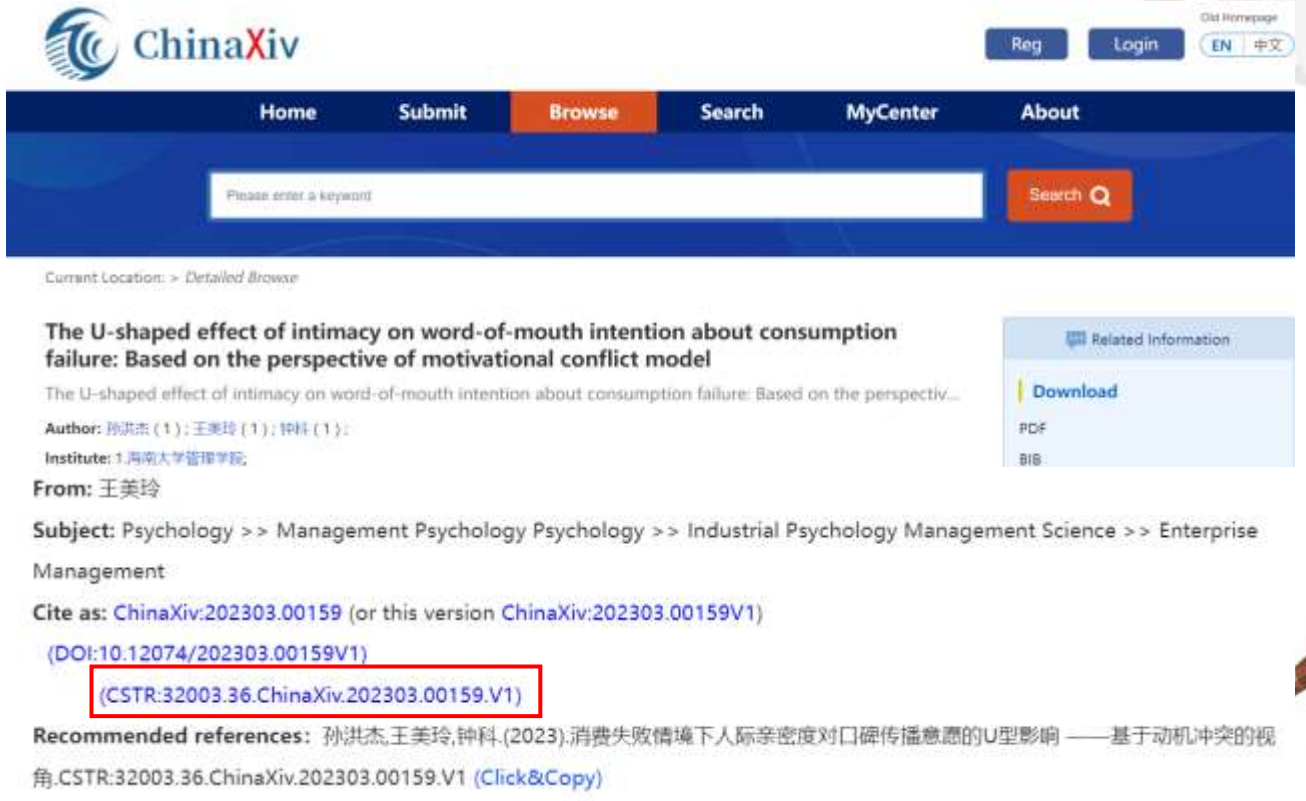
中華醫學會
CHINESE MEDICAL ASSOCIATION

Preprint

Preprint

Provide CSTR registration service for preprints in ChinaXiv platform of Chinese Academy of Sciences.

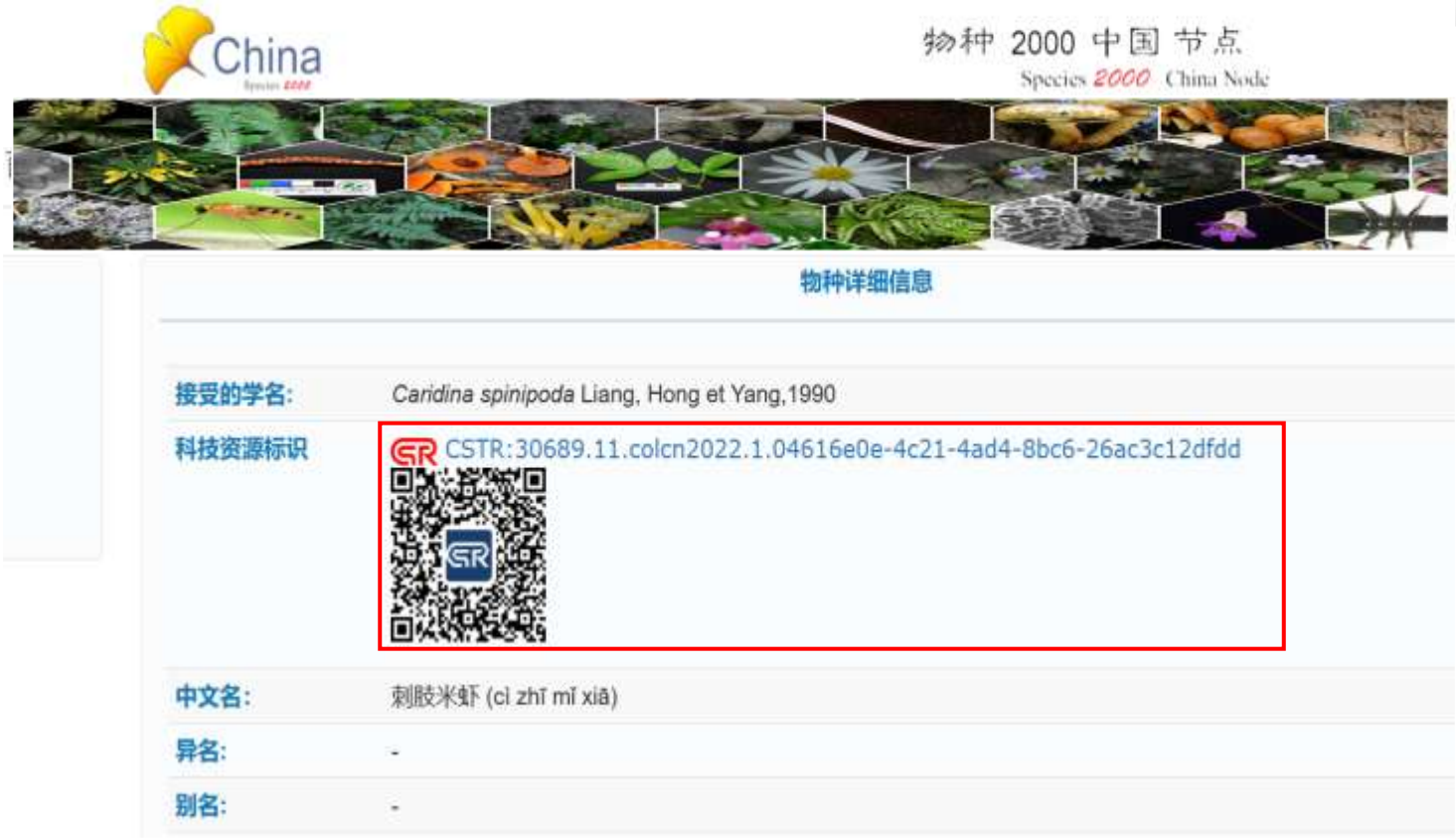
Currently **78,288** preprints have been supported.



Chinese Species List

Chinese Species List

Provides CSTR registration services for species lists on the Species 2000 China node. Currently supports **484,956** species.



Large Research Infrastructures

Large Research Infrastructures

Provides CSTR registration services for Large Research Infrastructures on the Chinese Academy of Sciences Large Research Infrastructures User Service Platform. Currently supports **401** facilities and related equipment.

Intelligent Identification

Highlight visualization

Resolution to Platform detail page

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CSTR Identification Gansu Node

Collaboration with the National Glacier Cryosphere Desert Science Data Center to establish the CSTR identifier Gansu node.

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CSTR Malaysia Node

Collaboration with HSAAS(Hospital Sultan Abdul Aziz Shah) to establish a CSTR Malaysia node to support open sharing of science in Malaysia.

CSTR Central Asian Node

The CSTR Central Asian Node aims to provide the technology to support the development of the countries in the Belt and Road Initiative, specialized in pharmacology and biomedicine.

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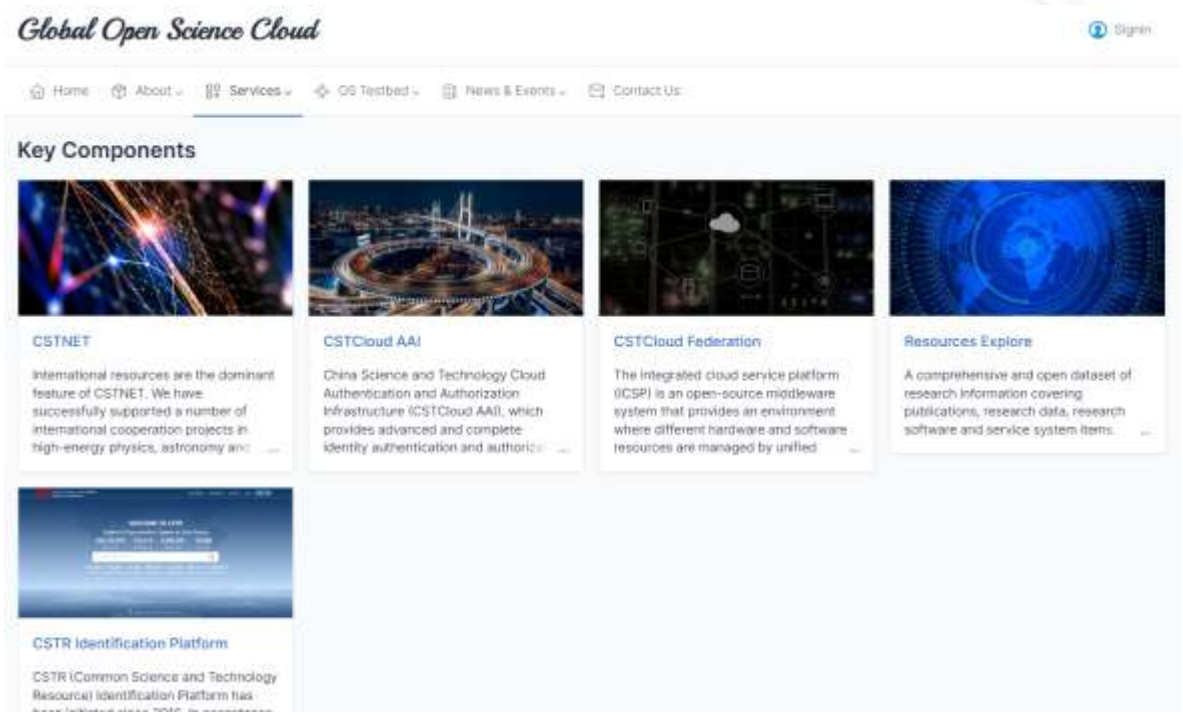
Key Components in GOSC

Key Components in GOSC

The Global Open Science Cloud (GOSC) aims to co-design and co-construct a cross-continental federated e-infrastructure and virtual research environment for global collaboration and open science through harmonized policies, interoperable protocols, transparent services and ongoing mechanisms. CSTR has been embraced by GOSC as a key component.

https://goscloud.net/



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International Cooperation/Workshop

The International workshop on Open Science Identifier
(17 Oct - 18 Oct 2023, Beijing, China)

IDW 2023: A Festival of Data,
(23–26 October 2023, Salzburg, Austria)

March 20th 2023co-located with the RDA
20th Plenary Meeting

PID Fest,
(11–13 June, Prague, Czechia)

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Double Identification with Datasheets

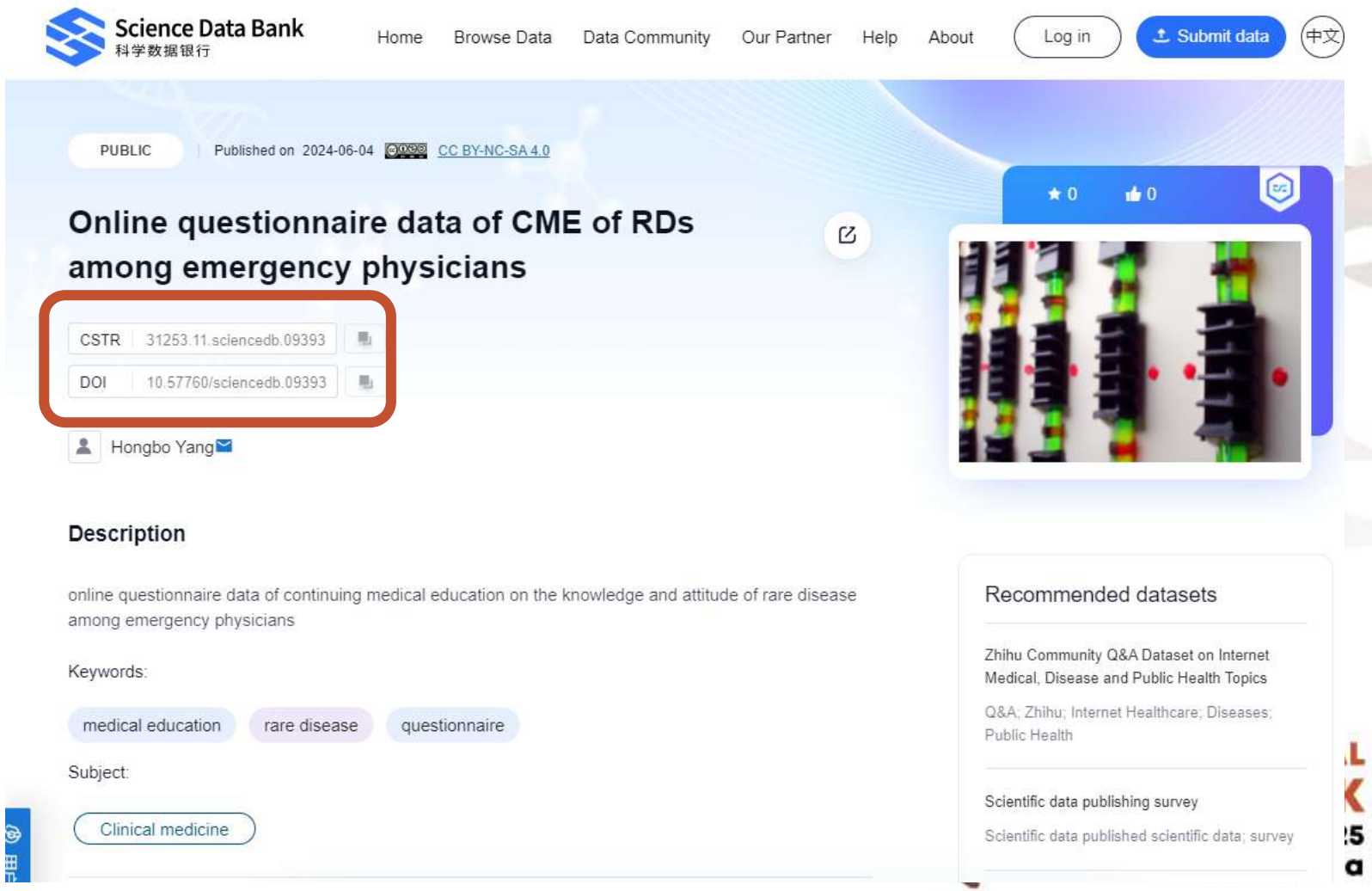
Science Data Bank
科学数据银行

CSTR Services

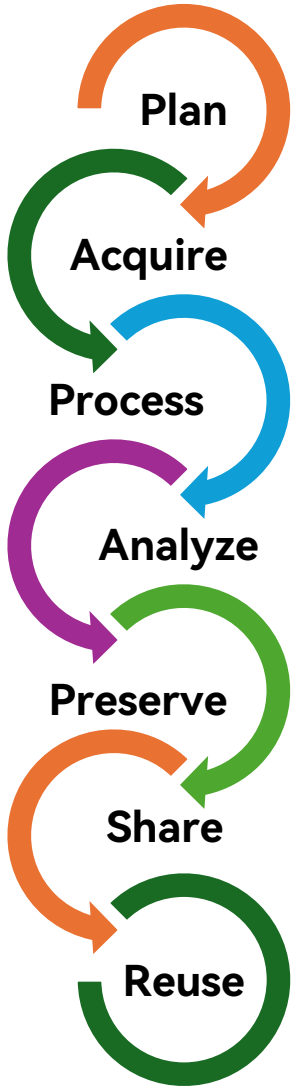
DOI Services

Support DOI service

DataCite
CONNECTING RESEARCH, ADVANCING KNOWLEDGE



Double Identification with Research Workflows



Unified ID Bridge Interface

Building bridges between different identifiers

Handle.Net®

DataCite
CONNECTING RESEARCH, ADVANCING KNOWLEDGE

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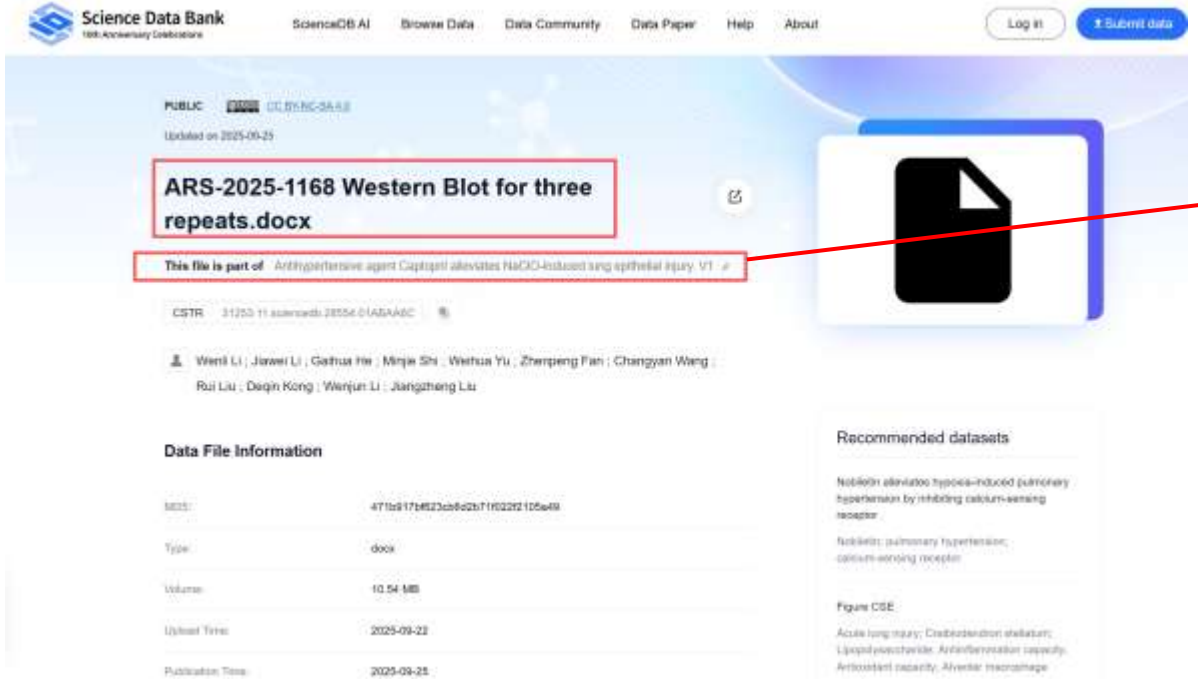
CSTR with files

CSTR supports large-scale registration of scientific data files (up to tens of millions) using, while establishing an intelligent file-dataset.

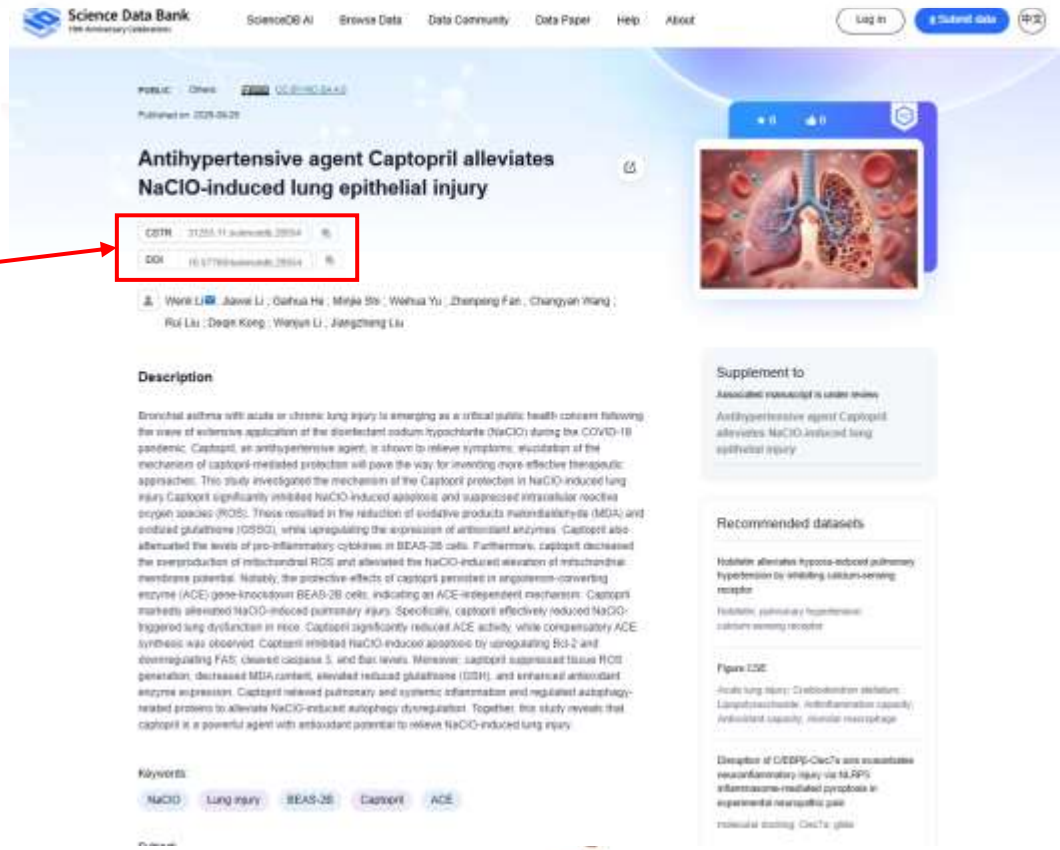
Files

https://cstr.cn/31253.11.sciencedb.28554.01ABAA6C



Related datasets

https://cstr.cn/31253.11.sciencedb.28554



Support by the National Key Research and Development Program "*Key Technology Research and Application of Trusted Services for Typical Science and Technology Resource Identification* " (2023YFF0616900)

Thank you for your attention.

Links

CSTR Identification Platform

https://www.cstr.cn/en/

Contact

Mail :

cstr@cnic.cn

Address:

Computer Network Information Center, Chinese Academy of Sciences

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